

REMARKS

Claims 1-26 are now present in this application.

Claim 1 has been amended, and claims 25 and 26 have been presented. Reconsideration of the application, as amended, is respectfully requested.

Newly Presented Claims

It is noted that newly presented claim 25 depends from independent claim 1, and recites the fabrication of the doping layer in detail. Support for this claim 25 can be found in Figs. 5 and 6 of the originally filed drawings and page 8, line 20 through page 10, line 4 of the originally filed specification.

Newly presented claim 26 depends from claim 15, and recites the fabrication of the doping layer in detail. Support for this claim 26 can be found in Figs. 5 and 6 of the originally filed drawings and page 8, line 20 through page 10, line 4 of the originally filed specification.

Accordingly, it is respectfully submitted that no new matter is present in these newly presented dependent claims.

Objection to the Claims

Claim 1 stands objected to for certain informalities. In view of the foregoing amendments, it is respectfully submitted that these informalities have been addressed. Reconsideration and

withdrawal of any objection to the claims are respectfully requested.

Rejection under 35 USC 102(b)

Claims 15, 18, 20 and 21 stand rejected under 35 USC 102(b) as being anticipated by RADENS, U.S. Patent 6,265,279. This rejection is respectfully traversed.

RADENS fails to disclose or suggest the limitation of **"forming a doping layer and a cap layer covering part of the sidewall of the trench"** and **"performing an annealing process on the doping layer and forming a dopant region in the substrate adjacent to the sidewall of the trench,"** as is disclosed in independent claim 15.

In RADENS, the dopant region 220 (or the dopant profile 220 of column 6, line 16), which shown in Fig. 3, is formed in sidewalls 214 of trench 206 (see column 5, lines 49-52) by retrograde doping of trench sidewalls (see column 5, line 25). Thus, RADENS teaches neither the feature **"forming a doping layer and a cap layer covering part of the sidewall of the trench"** nor the feature **"performing an annealing process on the doping layer and forming a dopant region in the substrate adjacent to the sidewall of the trench,"** as is disclosed in independent claim 15 of the present application.

Therefore, RADENS fails to teach or suggest all of the limitations of independent claim 15 and its dependent claims.

Accordingly, reconsideration and withdrawal of the 35 USC 102(b) rejection are respectfully requested.

Rejection under 35 USC § 103

Claims 1-6, 10-12 and 14 stand rejected under 35 USC 103 as being unpatentable over RADENS. This rejection is respectfully traversed.

Claims 7, 9, 13, 17 and 19 stand rejected under 35 USC 103 as being unpatentable over RADENS in view of MANDELMAN, U.S. Patent 6,163,045. This rejection is respectfully traversed.

Claims 8 and 16 stand rejected under 35 USC 103 as being unpatentable over RADENS in view of BECKER, U.S. Patent 4,782,036. This rejection is respectfully traversed.

Under **MPEP 2143**, to establish a prima facie case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

As noted above, the dopant region 220 of RADENS (or the dopant profile 220 of column 6, line 16), which is shown in Fig. 3, is formed in sidewalls 214 of trench 206 (see column 5, lines 49-52) by retrograde doping of trench sidewalls (see column 5, line 25). RADENS fails to teach or suggest the features of "forming a doping layer on portions of each sidewall of the trench above the dielectric layer and the first conductive layer to cover portions of sidewalls of the trench in the upper portion," "forming a cap

layer on each exposed sidewall and each doping layer," "performing an annealing process on each doping layer to form a dopant region in the adjacent substrate, wherein each dopant region blocks leakage current resulting from a parasitic transistor adjacent to the trench and has a first distance from the surface of the substrate," as is recited in independent claim 1.

Accordingly, the cited reference cannot make the claimed invention obvious under § 103, as there is no teaching of forming a dopant region in the adjacent substrate by sequentially forming a doping layer on portions of each sidewall of the trench above the dielectric layer and the first conductive layer to cover portions of sidewalls of the trench in the upper portion, forming a cap layer on each exposed sidewall and each doping layer and performing an annealing process on each doping layer and the doping region is vertically distributed in the substrate adjacent to the trench and approximately equidistant from the trench and has same doping concentration therein. Furthermore, the cited references teach away from the invention by forming a dopant region by retrograde doping.

Thus, RADENS fails to teach all of the limitations recited in independent claim 1 of the present application, as well as its dependent claims. The secondary references utilized by the Examiner fail to overcome the deficiencies of the primary reference. Accordingly, reconsideration and withdrawal of the 35 USC 103 rejections are respectfully requested.

Conclusion

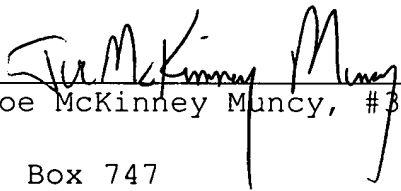
Favorable reconsideration and an early Notice of Allowance are earnestly solicited.

In the event that any outstanding matters remain in this application, the Examiner is invited to contact the undersigned at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By 
Joe McKinney Muncy, #32,334
P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

KM/asc
0941-0849P

(Rev. 02/12/2004)